

We Claim:

- 1 1. Apparatus for dislodging foreign material from a cavity of an object
2 that includes:
3 a tubular guide having a distal end and a proximal end such that the distal
4 end of guide can be inserted into the interior cavity of said object;
5 a tubular sleeve mounted over at least the lower portion of said guide so that
6 said sleeve can rotate about the axis of said guide;
7 a wire passing through said guide so that an upper end of the wire extends
8 outwardly from the distal end of the guide and a lower portion of the wire extends
9 outwardly from the proximal end of the guide; and
10 wherein the extended lower end of the wire is secured to said sleeve whereby
11 the wire and the sleeve can rotate together about the axis of the guide.
- 1 2. The apparatus of claim 1 that includes further drive means for
2 rotating said sleeve and said wire together.
- 1 3. The apparatus of claim 2 wherein said means for securing said lower
2 end of the wire to said sleeve is an adjustable chuck that is connected to said drive
3 means, said chuck having jaws that are arranged to close over the sleeve and the wire
4 to crimp the wire into engaging contact against the outside of said sleeve whereby
5 the sleeve and the wire can be rotated together by said drive means.
- 1 4. The apparatus of claim 3 wherein drive means is an electric motor.
- 1 5. The apparatus of claim 1 wherein said wire forms a close running fit
2 with the interior wall of said guide.
- 1 6. The apparatus of claim 1 wherein said distal end of the guide is bent
2 at an angle with relation to the axis of said guide.

1 7. The apparatus of claim 6 wherein said distal end of the guide forms
2 an angle of about 30° with said axis of said guide.

1 8. The apparatus of claim 7 wherein the axial length of said sleeve is
2 about half that of said guide.

1 9. A method for dislodging foreign material from hard to reach regions
2 of an object that includes the steps of:
3 inserting a rigid tubular guide having a bent distal end tip into the object;
4 directing the tip of the guide at a hard to reach region in said cavity;
5 passing a wire through said guide so that the upper end of the wire can reside
6 at the hard to reach region and the lower end of the wire extends outwardly from the
7 proximal end of guide;
8 rotatably mounting a portion of the guide within a tubular sleeve; and
9 securing the lower end of the wire to the sleeve.

1 10. The method of claim 9 that includes the further step of rotating the
2 sleeve and the wire together about the axis of said guide.

1 11. The method of claim 9 wherein the lower end of the wire is secured
2 to the sleeve by closing the jaws of a chuck over the sleeve and the wire to crimp the
3 wire against the sleeve.

1 12. The method of claim 9 that further includes the step of mounting the
2 object in a holding fixture.

1 13. The method of claim 9 that includes the further step of bending the
2 tip of the guide at the distal end thereof at an angle of about 30°.

1 14. The method of claim 10 that includes the further step of connecting
2 said chuck to a motorized driver for turning the chuck at a desired speed.

1 15. An apparatus for dislodging foreign material from a hard to reach
2 region of an object, comprising:
3 a guide;
4 a wire in said guide that is capable of rotation within said guide; and
5 wherein said guide has an angled portion at a distal end to direct said wire at
6 said hard to reach region.